18. The tire according to Claim 15 wherein said second membrane has a wavelength of undulation between about 20% and 50% of the rolling tread width of said tread portion.

19. The tire according to Claim 15 wherein said tread portion has at least one groove having a tread depth of at least 120% of a nominal tread depth.

20. The tire according to Claim 1 wherein said sidewall portion has an effective radial stiffness in tension greater than an effective radial stiffness in compression.

21. The tire according to Claim 20 wherein said sidewall portions are substantially inextensible in tension and substantially without resistance to compressive buckling.

22. The tire according to Claim 20 wherein said sidewall portions are reinforced by substantially radial elements.

23. The tire according to Claim 20 where said sidewall portions are rectilinear in the tire meridian plane.

24. The tire according to Claim 20 wherein said sidewall portion has a maximum thickness less than 10% of the radial section height of said tire.

25. The tire according to Claim 1 wherein a ratio of said longitudinal stiffness of said annular band in the tire equatorial plane to an effective radial stiffness of said sidewall portion in tension is less than 100:1.

26. A structurally supported resilient tire comprising a ground contacting tread portion, sidewall portions extending radially inward from said tread portion and anchored in bead portions adapted to remain secure to a wheel during rolling of the tire, and,

a reinforced annular band disposed radially inward of said tread portion, said band comprising an elastomeric shear layer, at least a first membrane adhered to the radially inward extent of said elastomeric shear layer and at least a second membrane adhered to the radially outward extent of said elastomeric shear layer, and

said second membrane is undulated having amplitude of undulation in the radial direction and a wavelength of undulation in the axial direction,

whereby deforming said second membrane from substantially a circular shape to a flat shape by an externally applied load occurs without longitudinal buckling of said second membrane and maintains a substantially uniform ground contact pressure of said ground contacting tread portion throughout the length of the ground contacting region.

27. A structurally supported resilient tire comprising a ground contacting tread portion, sidewall portions extending radially inward from said tread portion and anchored in bead portions adapted to remain secure to a wheel during rolling of the tire, and,

a reinforced annular band disposed radially inward of said tread portion, said band comprising an elastomeric shear layer, at least a first membrane adhered to the radially inward extent of said elastomeric shear layer and at least a second membrane adhered to the radially outward extent of said elastomeric shear layer, and

a ratio of said longitudinal stiffness of said annular band in the tire equatorial plane to an effective radial stiffness of said sidewall portion in tension is less than 100:1,

whereby rotation of said tire under applied load causes a circumferential expansion of said annular band and induces an additional tension in said sidewall portions and reduces the radial deflection of said tire relative to the non-rotating condition.

28. A structurally supported resilient tire comprising a ground contacting tread portion, sidewall portions extending radially inward from said tread portion and anchored in bead portions adapted to remain secure to a wheel during rolling of the tire, and said tread portion having,

a reinforced annular band disposed radially inward of said tread portion, said band comprising an elastomeric shear layer, at least a first membrane adhered to the radially inward extent of said elastomeric shear layer and at least a second membrane adhered to the radially outward extent of said elastomeric shear layer, and

wherein said sidewall portions are substantially inextensible in tension and substantially without resistance to compressive buckling,

whereby an externally applied load is supported substantially by tensile forces in said sidewall portion in the region of the tire out of contact with the ground and substantially without vertical load support due to the sidewall portion in the region in contact with the ground.

28. A method for making a structurally supported resilient tire with a reinforced annular band having an elastomeric shear layer between longitudinally stiff members, comprising the steps of:

selecting a ground contact pressure and tire radius;

multiplying the ground contact pressure by the tire radius to determine a shear layer factor;

selecting a shear layer material having a shear modulus of elasticity and with a thickness so that the product of the shear modulus of elasticity times the thickness is equal to the shear layer factor;

selecting membranes having a tensile modulus of elasticity at least 100 times the shear modulus of elasticity, and;

assembling a ground contacting tread portion, said reinforced annular band disposed radially inward of said tread portion, at least a first membrane adhered to the radially inward extent of said elastomeric shear layer and at least a second membrane adhered to the radially outward extent of said elastomeric shear layer, and sidewall portions extending t radially inward from said tread portion and anchored in bead portions for securing to a wheel.